

In the third enumerated paragraph of the statement of the rejection, the Examiner objected to claims 2, 5, and 9 for various informalities. In response, Applicant has amended claims 2, 5, and 9 per the Examiner's suggestions.

**Claims 1-2 and 14-15 are rejected under 35 U.S.C. § 102(b) for lack of novelty as evidenced by Sung, U.S. Patent No. 6,137,130**

In the fourth enumerated paragraph of the Office Action, the Examiner asserted that Sung discloses a semiconductor device corresponding to that claimed. Applicant notes that the Examiner stated that claims 15 and 16 are rejected; however, it is apparent the Examiner intended to reject claims 14 and 15, as claim 16 is withdrawn from consideration pursuant to the provisions of 37 C.F.R. § 1.142(b) and claim 14 was not otherwise addressed in the Office Action. The rejection as to claims 1-2 and 14-15 is respectfully traversed.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the identical disclosure in a single reference of each element of a claimed invention, such that one having ordinary skill in the art would have recognized that the identically claimed invention is within the public domain. **ATD Corporation v. Lydall, Inc.**, 159 F.3d 534, 48 USPQ2d 1321 (Fed. Cir. 1998); **Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.**, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994). Accordingly, in rejecting a claim under 35 U.S.C. § 102, it is incumbent upon the Examiner to identify wherein an applied reference identically discloses each feature of the claimed invention. **In re Rijckaert**, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); **Lindermann Maschinenfabrik GMBH v. American Hoist & Derrick Co.**, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984). Furthermore, 37 C.F.R. § 1.104(c)(2) states that "[w]hen a

reference is complex or shows or describes inventions other than that claimed by the application, the particular part relied on must be designated as nearly as practicable" by the Examiner. This burden has not been met.

In the statement of the rejection, the Examiner associated the reference numerals disclosed in Sung with various limitations found in the claim. For example, the Examiner has indicated reference numerals for transfer gates (44), contact plugs (50), a gate insulating film (3), a gate electrode (4), a second insulating film (12), a bit line (14), and a third insulating film (52). Applicant notes, however, that the Examiner did not identify a reference numeral in Sung for a first insulating film. As such, Sung fails to teach or suggest a first insulating film comparable to that disclosed in claim 1.

Claim 1 recites that a first interlayer insulating film has a surface which defines the same surface as the surface of a transfer gate and the surface of a contact plug. This feature, for example, can be illustrated in Figs. 11A-C, which disclose a first interlayer insulating film 44, transfer gates (not identified with a reference numeral, but identified with reference numeral 33 in Fig. 14A), and contact plugs 50. The claimed feature results from each of the first interlayer insulating film 44, transfers gates 33, and contact plugs 50 being subjected to a common polishing step (page 13, lines 16-20). This common polish step produces the surface of the first interlayer insulating film 44 that also defines the same surface as the surface of the transfer gates 33 and the surface of the contact plugs 50. Sung, however, fails to teach such a first interlayer insulating film.

Applicant further notes that Sung teaches the formation of a capping silicon nitride layer 6 over the gate electrode 4, 5 (column 3, lines 9-40). This silicon nitride layer 6 prevents the gate electrode 4, 5 from sharing a same surface with the contact plugs 50. Therefore, Sung further fails to teach or suggest a first interlayer insulating film having a surface which defines the same surface as the surface of a transfer gate and the surface of a contact plug, as recited in claim 1.

With regard to claims 14 and 15, the Examiner asserted that "an old or obvious product produced by a new method is not a patentable product, whether claimed in 'product by process' claims or not." It is apparent that the Examiner is assuming that a CVD film or a thermal oxidation film are identical films regardless of the process used to form the film. This assumption, however, is incorrect.

Depending upon the type of process used to form a film, the formed film can have different properties. As an illustrative example, Applicant refers the Examiner to Peter Van Zant, Microchip Fabrication A Practical Guide to Semiconductor Processing 383 (4th ed. 2000), a copy of which is attached hereto and reproduced in part below:

CVD-deposited silicon dioxide films vary in structure and stoichiometry from thermally grown oxides. Depending on the deposition temperature, deposited oxides will have a lower density and different mechanical properties, such as index of refraction, resistance to cracking, dielectric strength, and etch rate.

Therefore, structural differences exist between films that are formed by different processes. As such, the Examiner's assumption that a film formed by any process will be structurally indistinct is incorrect.

The above argued differences between the semiconductor device defined in claims 1-2 and 14-15 and the device of Sung undermine the factual determination that Sung identically describes the claimed invention within the meaning of 35 U.S.C. § 102. **Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics Inc.**, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); **Kloster Speedsteel AB v. Crucible Inc.**, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986). Applicant, therefore, respectfully submits that the imposed rejection of claims 1-2 and 14-15 under 35 U.S.C. § 102 for lack of novelty as evidenced by Sung is not factually viable and, hence, solicit withdrawal thereof.

**Claims 1-2 and 14-15 are rejected under 35 U.S.C. § 102(b) for lack of novelty as evidenced by Hosotani, et al., U.S. Patent No. 6,051,859 (hereinafter Hosotani)**

In the fifth enumerated paragraph of the Office Action, the Examiner asserted that Hosotani discloses a semiconductor device corresponding to that claimed. Applicant notes that the Examiner stated that claims 15 and 16 are rejected; however, as previously stated, it is apparent the Examiner intended to reject claims 14 and 15. The rejection as to claims 1-2 and 14-15 is respectfully traversed.

Claim 1, as originally presented, recites that the transfer gate includes a gate insulating film, a gate electrode layer, and sidewalls for covering sides of the gate insulating film and gate electrode layer. Claim 1, as amended, also recites that a first interlayer insulating film has a surface which defines the same surface as the surface of a transfer gate and the surface of a contact plug. As with Sung, the Examiner has identified some features in Hosotani that were recited in claim 1 with reference numerals and failed to identify other features with reference numerals.

Applicant notes that Hosotani teaches the formation of a capping silicon nitride layer 7 over the gate electrode 3 (column 8, lines 4-12). This silicon nitride layer 7 prevents the gate electrode 3 from sharing a same surface with the contact plugs 11. Therefore, Hosotani fails to teach or suggest a first interlayer insulating film having a surface which defines the same surface as the surface of a transfer gate and the surface of a contact plug, as recited in claim 1. Applicant also incorporates herein, as pertaining to Hosotani, the arguments previously presented with regard to the rejection of claims 14 and 15 in view of Sung.

The above argued differences between the semiconductor device defined in claims 1-2 and 14-15 and the device of Hosotani undermine the factual determination that Hosotani identically describes the claimed invention within the meaning of 35 U.S.C. § 102. Applicant, therefore, respectfully submits that the imposed rejection of claims 1-2 and 14-15 under 35 U.S.C. § 102 for lack of novelty as evidenced by Hosotani is not factually viable and, hence, solicit withdrawal thereof.

**Claims 3-12 are rejected under 35 U.S.C. § 103 for obviousness predicated upon Sung in view of Ozaki, et al., U.S. Patent No. 6,104,052 (hereinafter Ozaki)**

In the sixth enumerated paragraph of the statement of the rejection, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the semiconductor device of Sung with Ozaki to include the features recited in claims 3-12. This rejection is respectfully traversed.

Claims 3-12 depend ultimately from independent claim 1, and Applicant incorporates herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. § 102 for lack of novelty as evidenced by Sung. Specifically, Sung neither discloses nor suggests a first interlayer insulating film having a surface which defines the same surface as the surface of a transfer gate and the surface of a contact plug. The secondary reference to Ozaki does not cure the argued deficiencies of Sung. Accordingly, the proposed combination of references would not yield the claimed invention. **Uniroyal, Inc. v. Rudkin-Wiley Corp.**, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

Furthermore, the Examiner has not discharged the initial burden of establishing a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. § 103. **In re Mayne**, 104 F.3d 1339, 41 USPQ2d 1451 (Fed. Cir. 1997); **In re Oetiker**, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In rejecting a claim under 35 U.S.C. § 103, the Examiner is required to identify a source in the applied prior art for: (1) claim limitations; and (2) the motivation to combine references or modify a reference in the reasonable expectation of achieving a particular benefit. **Smiths Industries Medical System v. Vital Signs Inc.**, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999). The requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103 is not an abstract concept, but must stem from the applied prior art as a whole and have realistically impelled one having ordinary skill in the art to modify combine specific references to arrive at a specifically claimed invention. **In re Deuel**, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); **In re Newell**, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). Moreover, a generalization does not establish the requisite motivation to modify a specific reference in a specific manner to arrive at a specifically claimed invention. **In re Deuel, supra** Rather, a burden is

imposed upon the Examiner to identify a source in the applied prior art for each claim limitations and identify a source for the requisite realistic motivation to modify a particular reference in a particular manner to arrive at a specifically claimed invention. **Smiths Industries Medical System v. Vital Signs Inc., *supra*; In re Mayne, *supra*.**

With regard to the Examiner's comments as to claims 3 and 12, not only does Sung and Ozaki fail to teach a silicide film, as indicated in the Examiner's statement of the rejection, Sung and Ozaki also fail to teach a barrier metal. Therefore, the Examiner has failed to identify a source in the applied prior art for each claim limitation. Furthermore, although the Examiner's asserted motivation for forming the silicide is "to reduce the contact resistance between the bit line contact plug and the contact plug," the Examiner has failed to establish a source in the applied prior art for this particular teaching.

With regard to claims 4, 7-8 and 11, the Examiner stated that:

it would have been obvious to one of ordinary skill in the art at the time of the invention was made to form the device of Sung and Ozaki et al. having the materials as claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

The Examiner, however, has provided no evidence that the materials recited in claims 4, 7-8 and 11 are known materials for their recited use. The Examiner's failure to cite prior art after being challenged constitutes reversible error. **See Ex parte Natale, 11 USPQ2d 1222 (BPAI 1988); Ex parte Nouel, 158 USPQ 237 (Bd.App. 1967).**

The Examiner's stated motivation with regard to claims 5 and 9 is that one having ordinary skill in the art would have combined the applied prior art "in order to control the DRAM section to perform the desire [sic] function." This asserted motivation, however, is nothing more than a generalization to "combine various elements for the purposes of their basic function." If such a motivation was sufficient to establish a *prima facie* case of obviousness, then almost nothing could be patentable as nearly all inventions are combinations of old features. This "generalization" of a motivation, however, is not sufficient to establish a *prima facie* case of obviousness. Instead, the Examiner is obliged to explain why one having ordinary skill in the art would have been realistically led to modify a particular reference to arrive at a claimed invention. **In re Rouffet**, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

It should, therefore, be apparent that the Examiner did not discharge the initial burden of establishing a prima facie case of obviousness under 35 U.S.C. § 103. Applicant, therefore, respectfully submits that the imposed rejection of claims 3-12 under 35 U.S.C. § 103 for obviousness predicated upon Sung in view of Ozaki is not factually or legally viable and, hence, solicit withdrawal thereof.

**Claims 3-12 are rejected under 35 U.S.C. § 103 for obviousness predicated upon Hosotani in view of Ozaki**

In the seventh enumerated paragraph of the statement of the rejection, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the semiconductor device of Hosotani with Ozaki to include the features recited in claims 3-12. This rejection is respectfully traversed.

Claims 3-12 depend ultimately from independent claim 1, and Applicant incorporates herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. § 102 for lack of novelty as evidenced by Hosotani. Specifically, Hosotani neither discloses nor suggests a first interlayer insulating film having a surface which defines the same surface as the surface of a transfer gate and the surface of a contact plug. The secondary reference to Ozaki does not cure the argued deficiencies of Hosotani. Accordingly, the proposed combination of references would not yield the claimed invention. **Uniroyal, Inc. v. Rudkin-Wiley Corp.**, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

Applicant incorporates herein, as also pertaining to the rejection predicated upon Hosotani in view of Ozaki, the arguments previously presented with regard to rejection of claims 3-5, 7-9, and 11-12 predicated upon Sung in view of Ozaki. It should, therefore, be apparent that the Examiner did not discharge the initial burden of establishing a prima facie case of obviousness under 35 U.S.C. § 103. Applicant, therefore, respectfully submits that the imposed rejection of claims 3-12 under 35 U.S.C. § 103 for obviousness predicated upon Hosotani in view of Ozaki is not factually or legally viable and, hence, solicit withdrawal thereof.

**Claim 13 is rejected under 35 U.S.C. § 103 for obviousness predicated upon Sung in view of Lou, U.S. Patent No. 6,093,590**

In the eighth enumerated paragraph of the statement of the rejection, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the semiconductor device of Sung with Lou to include the features recited in claim 13. This rejection is respectfully traversed.

Claim 13 depends ultimately from independent claim 1, and Applicant incorporates herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. § 102 for lack of novelty as evidenced by Sung. Specifically, Sung neither discloses nor suggests a first interlayer insulating film having a surface which defines the same surface as the surface of a transfer gate and the surface of a contact plug. The secondary reference to Lou does not cure the argued deficiencies of Sung. Accordingly, the proposed combination of references would not yield the claimed invention. **Uniroyal, Inc. v. Rudkin-Wiley Corp.**, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988). Applicant, therefore, respectfully submits that the imposed rejection of claim 13 under 35 U.S.C. § 103 for obviousness predicated upon Sung in view of Lou is not factually or legally viable and, hence, solicit withdrawal thereof.

**Claim 13 is rejected under 35 U.S.C. § 103 for obviousness predicated upon Hosotani in view of Lou**

In the ninth enumerated paragraph of the statement of the rejection, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the semiconductor device of Hosotani with Lou to include the features recited in claim 13. This rejection is respectfully traversed.

Claim 13 depends ultimately from independent claim 1, and Applicant incorporates herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. § 102 for lack of novelty as evidenced by Hosotani. Specifically, Hosotani neither discloses nor suggests a first interlayer insulating film having a surface which defines the same surface as the

surface of a transfer gate and the surface of a contact plug. The secondary reference to Lou does not cure the argued deficiencies of Hosotani. Accordingly, the proposed combination of references would not yield the claimed invention. **Uniroyal, Inc. v. Rudkin-Wiley Corp.**, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988). Applicant, therefore, respectfully submits that the imposed rejection of claim 13 under 35 U.S.C. § 103 for obviousness predicated upon Hosotani in view of Lou is not factually or legally viable and, hence, solicit withdrawal thereof.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Applicant has made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. Accordingly, and in view of the foregoing remarks, Applicant hereby respectfully requests reconsideration and prompt allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417, and please credit any excess fees to such deposit account.

Respectfully submitted,

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**Version with markings to show changes made**

**IN THE CLAIMS:**

2. (Amended) The semiconductor device according to claim 1, further including a memory cell section having a plurality of memory cells,

    said memory cell section including, in addition to said transfer gates, said contact plugs, and said first and second interlayer insulating films,

    a bit line formed on said second interlayer insulating film;

    a third interlayer insulating film formed on said second interlayer insulating film so as to cover said bit line; and

    capacitors formed on said third interlayer insulating film;

    said memory cell section further including[, as] said diameter-reduced contact plugs, which include

        a bit line contact plug which extends through said second interlayer insulating film to bring said contact plugs and said bit line into conduction; and

        a capacitor contact plugs which extend through said second and third interlayer insulating films to bring said contact plugs and said capacitors into conduction.

5. (Amended) The semiconductor device according to claim 2, further including a logic circuit section including a plurality of transistors, said logic section including, in addition to said transfer gates, said contact plugs, and said first and second interlayer insulating films,

    bit lines formed on said second interlayer insulating film; and

    said logic circuit section further including, as said diameter-reduced contact plugs,

bit line [contract] contact plugs which extend through said second interlayer insulating film to bring said contact plugs and said bit lines into conduction.

9. (Amended) The semiconductor device according to claim 1, further including a logic circuit section including a plurality of transistors, said logic section including, in addition to said transfer gates, said contact plugs, and said first and second interlayer insulating films,

bit lines formed on said second interlayer insulating film; and

said logic circuit section further including, as said diameter-reduced contact plugs,

bit line [contract] contact plugs which extend through said second interlayer insulating film to bring said contact plugs and said bit lines into conduction.